

This workshop introduces the development of model estimation data sets, the structures of the various model components, and the procedures for estimating models. At the end of the series, participants will be able to better manage model development done for them by others (e.g., consultants) and to understand and evaluate the results.

Questions and Answers during Session I

Q: How should we validate model results of forecast years?

A: This is a very good question. There is no particular validation standard for forecast years. However, one way to address forecast years is to test a bunch of forecast scenarios. These scenarios could be based on different levels of socio-economic forecasts or based on different levels of highway and transit network activity. Once the scenarios are run, the model's sensitivity can be evaluated.

Q: What criteria should we pay attention to while borrowing parameters from other models?

A: Parameters must be borrowed with caution. It is always recommended that once the parameters are borrowed, the performance of the model be evaluated for the area in question using data sources such as CTPP Journey to work or any other local sources of information (HH surveys, count information etc.)

Q: Have you worked with travel models where trip generation was based on land uses?

A: Yes. All trip generation models rely on good land use and socio-economic estimates and forecasts. These include the distribution of various types of employment (such as retail, non-retail), household types (based on vehicle ownership, household size, etc.). Some advanced models also use parcel-level data that identify proportions of developable land and forecasts of these proportions.

Q: Will you provide a sample model development plan?

A: Yes. In this presentation we will provide a broad overview of the main components. In the series that follows, we will address each of the major components of model development.

Q: Please refresh my memory - what is BPR?

A: Bureau of Public Roads; BPR is a vdf function

Q: HH surveys are not conducted yearly. As we know, the economic conditions are volatile. What proxy measures do we use between the gathering of HH surveys (every 5 years or so)?

A: Our apologies. We seem to be back now. Indeed, the economic conditions are volatile. It is not feasible to do HH surveys each year. Therefore, the models need to be applied to the changing conditions to see how they perform. If there have been dramatic changes, this may necessitate recalibrating some of the model parameters

Q: What sources of data do you use for trip attraction?

A: Typically, we use HH surveys and employment estimates from state or local sources

Q: How establishment survey is used in estimation process?

A: Establishment surveys can be used to get a profile of the households; these can supplement the information from household travel interview surveys. These surveys could be particularly helpful for attraction estimation. However, the representativeness of these surveys remains an issue. To our knowledge, establishment surveys are not very frequently used for estimation purposes.

Q: Can you also use the establishment survey for balancing the production/attraction?

A: While balancing productions and attractions, we typically need to determine whether we are more confident about the Ps or about the As. Additional sources can help us make this determination.

A1: Also, regarding trip balancing, my opinion is that since we are sure of production side of trips than on the attraction side of trips, we can hold P's constant and try balance A's.

A: This is a good point. Nonetheless, for some purposes such as NHB, we usually maintain the production totals, but use the attraction patterns to re-structure the productions. If you use a destination choice model, the whole balancing process is unnecessary.

Q: How do we develop a cost function for a particular modeling area? How do we know the values of cost/min, cost/mile, etc? I concede that we know toll cost.

A: I am assuming you are talking about the mode choice parameters. If this is the case, things such as value of time etc. will be implicit to the model parameters that we are borrowing. Once the parameters are borrowed, we apply them to data within the region. So even if you borrow parameters, you have to provide some local data such as socio-economics, networks, costs etc.

Q: No Yasasvi. I was talking about the function that is used in calculating restrained and freeflow skims

A: The BPR function parameters, the a and b, are calibrated for the area during the validation/calibration phase.

Q: What criteria should we keep in mind while borrowing parameters from other models?

A: Several things. First, which area are the parameters being borrowed from? Second, once the parameters have been borrowed and applied, do they conform to what is observed in that area with respect to trip densities, trip distribution, ridership, traffic volumes etc.

Q: The highway assignment slide, the optimization process. Can you explain that further?

A: Please see this link and let me know if you need more information:

<http://tmip.fhwa.dot.gov/clearinghouse/docs/general/dvrt/ch4.stm>

Q: What are your thoughts on using destination choice models in place of gravity models?

A: Destination choice models are definitely more behaviorally rigorous and are also easily amenable to model validation. In fact many four step models have used destination choice models to replace the traditional gravity models. The cost is the time and resources for estimating the models. The benefit is better reflection of observed travel behavior.

Q: What is the role of dynamic assignment in regional and sub area modeling?

A: dynamic modeling can certainly be used to evaluate key transportation decisions such as real-time information systems, congestion pricing etc. However, it is usually common in conjunction with tour and activity-based models.

Q: Since all these models involve stochastic processes, how do the models control for serial autocorrelation?

A: Serial auto-correlation is an issue in time series models. We are not talking about time series models here. Rather, we are talking about snapshots at multiple points in time.

Q: Yes, we are looking at snapshots, but there is autocorrelation between different times of day that the models do not take into account.

A: Sure, models have several weaknesses. Four step models deal with simplification of the real life travel behavior. As for TOD, four step models typically use static TOD factoring from HH surveys.

Q: About the area type, could that also include information such as bike-friendliness, existence/width of sidewalk network? The same way that a rural area typically becomes exurban sprawl, residents of a suburban area will have different behavior when conditions (gas prices) change. If you have an area with a decent sidewalk network, then their mode choice will change. Compare that to an area with no sidewalks, gas may be extremely high, but without sidewalks fewer people will walk, resulting in fewer trips. Anyway, just a thought that this needs to be considered, typically our models have detailed roadway networks, but nothing about sidewalks.

A: Sure! We have seen models that have used pedestrian environment variables. If reliable bike friendliness info is available, it can definitely be used in mode choice models.

Q: To get transfer counts in transit system, is there any other source other than AFC data?

A: This information can be obtained from transit on-board surveys, which are great sources of not just transfer behavior, but also access behavior to transit stations.

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